DOCUMENT RESUME

ED 244 739 PS 014 299

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TITLE Future Follow Through Documentation and Research: The Assessment of Academic/Cognitive Abilities of Black Children.
SPONS AGENCY National Inst. of Education (ED), Washington, DC.
PUB DATE [81]
NOTE 34p.
PUB TYPE Viewpoints (120)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Achievement Tests; *Black Youth; Cognitive Ability; *Cognitive Processes; *Cognitive Style; Cultural Differences; Early Childhood Education; Ecology; Elementary Education; Guidelines; Program Evaluation; *Standardized Tests; *Testing Problems; Test Validity
IDENTIFIERS Project Follow Through

ABSTRACT

Offering guidelines for future Follow Through program design, documentation, and evaluation, this paper examines the bases of criticisms of standardized tests, describes learning characteristics of black children, and briefly enunciates a system for Follow Through evaluation efforts. Discussion of standardized tests addresses the following criticisms: (1) Items on tests of mental ability are not based on any theory of cognitive or intellectual functioning; (2) Tests yield little information regarding the cognitive process; (3) Standardized test formats preclude clarification of questions asked; (4) Cultural bias exists in test content, language, and format; and (5) Tests are of little use in diagnostic efforts to guide instruction. Exploration of black children's learning characteristics focuses on the nature of the intellectual processes of black children; problems of designing tests with ecological validity; the influence of home and neighborhood environments on cognitive organization and intellectual styles; implications for cognitive assessment; frameworks for an integrated conceptual paradigm (the adaptive analysis of social behavior and the processes of rule induction); and the generality of an inductive learning style among black children. Recommendations for language and cognitive assessment activities are offered along with suggestions for replacing the evaluation of planned variation models of Follow Through programs with a "bottom-up" approach to documentation and instrument development. (RH)

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FUTURE FOLLOW THROUGH DOCUMENTATION AND RESEARCH: THE ASSESSMENT OF ACADEMIC/COGNITIVE ABILITIES OF BLACK CHILDREN

Dalton Miller-Jones

Previous evaluation and documentation efforts of Follow Through have been ambiguous in the determination of significant cognitive and academic advances as a result of specific "treatments" contained in the planned variation among models. Several reasons exists for this state of affairs. These include: lack of specification of the distinctions between and within models and inadequate and unidimensional standardized assessment instruments and techniques. While a national evaluation was certainly in order, the expectation that these initial efforts would produce definitive "answers" to the questions of how to foster better educational and intellectual attainment among Black and other minority children was premature. Future Follow Through Program design, documentation and evaluations should be guided by the following consideratic s: 1. the development of a rich well organized body of knowledge about the social-cultural and cognitive characteristics of the target populations; 2. the need to develop clear descriptions of subject matter domains with the help of discipline specialists; 3. the need to specify the variety of cognitive processes involved in learning tasks such as reading, math, writing, and science especially those processes known to be operating in the successful achievement of competence in these information domains; 4. the need to generate a conceptual approach which would systematically integrate the relative contributions of parent involvement, services (e.g. health and nutritional effects), and individual differences in personality and social orientation with the above; and 5. the need to abandon the "planned variation" concept in favor of procedures which provide valuable information about effective instruction.

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Conceived initially as a means for sustaining academic and cognitive gains among culturally distinct and low income children achieved in Head Start experiences, Follow Through Projects have had a controversial and stormy history. Past F.T. documentation and evaluations have centered on traditional standardized assessement tools, such as the Metropolitan and Stanford Achievement Tests, mental abilities tests such as the Raven's Colour Progressive Matrices Test, and affective measures such as the Intellectual Achieverent Responsibility Scale and Coppersmith's Self-Esteem Inventory.

The results of analysis of program (model) effects using these instruments are inconclusive. Among the many evaluation design problems were: lack of a method for documenting what the various projects within a model were in fact doing instructionally; insufficient information on the F.T. and Non-F.T. populations, making control and experimental comparisons difficult to interpret and possibly leading to the wide variability obtained within and between models; the lack of alternative acceptable measures appropriate to the stated objectives of different projects; and the necessity to artificially define and aggregate the various projects into categories for the purpose of determining which of the "planned variations" was most effective.

From the perspective of minority communities all of the stated goals across the models would be desireable to achieve in each program! Basic skills, cognitive-conceptual, and affective-cognitive objectives need to be encouraged for all F.T. children. Where differences of opinion may arise is in the preferred instructional approach to be used to produce these outcomes. What do we need to know in order to inform parents, children, teachers and their support systems (administrators, specialists, friends in the community) about the most effective ways to educate their children?

I believe we need to tell them what existing standardized tests can and cannot tell us about their children's knowledge and competencies. Given the various uses of test information, what new approaches need to be developed? This requires, I believe, research on taxonomies of academic-instructional tasks and teacher-learning process descriptors. We need ways to document the kinds of learning environments experienced by children beyond general classifications of instructional methods such as basic skills or even phonic decoding and language experience methods. Precise statements of tasks posed and teacher behaviors need to be developed and organized into classifications applicable across various F.T. sites. We need to specify the learning characteristics of minority children in terms of their strategies for processing information and deriving concepts. We need studies to determine the critical factors influencing the use of these cognitive structures and operations. Given the perception of alternative ways to approach a problems solution what governs the child's selection of any particular one? This information will have implications for developing new instructional approaches and methods of assessing outcomes produced. Let us examine each of these proposals.

Standardized Tests

Currently available tests of ability and achievement are widely used for a variety of reasons including their general public acceptance, the assumption that a score means the same thing for any individual taking the test, they are cheap and easy to use. These tests have been used for several purposes including:

1. accountability- achievement test scores have been used to assess the effectiveness of teachers, schools, and school districts as indicators of the amount of learning accomplished.
2. Selection and Sorting- test scores of individual students are used to make decisions of placement in special programs, ability grouping within classrooms and to make career and other counselling decisions
3. Classroom instruction- tests are used to make curricular decisions. Knowing test determined strengths and weaknesses in some skill area directs teachers to spend more time in instruction. This is related to accountability concerns because tests will determine what gets emphasized in teaching, which is fine as along as these areas are the most critical to be learning.

Standardized tests have been criticized on a number of issues.

1. Standardized tests of ability and achievement are not based on any definitive theory of cognition or intelligence.
2. Consequently these tests yield little or no information regarding cognitive processes used by children in arriving at an answer.
3. Standardized test formats preclude test administrators from providing any feedback to individuals to help clarify the question being asked. This results in selecting for individuals who know the testing game.
4. Cultural bias in test content, language and format.
5. Tests of ability and achievement are administered at intervals which make it impossible for any useful diagnostic feedback to influence the teaching process for the particular set of children taking the test. Further, most of these instruments are not amenable to repeated administration. Repeated assessments are terribly important in measuring gains over time. Periodic testing provides valuable information concerning rate of growth which maybe more important than establishing a child's absolute level of achievement in determining how a program is doing.

Let us now examine the bases of these criticisms.

The items on test of mental ability (I.Q.) are not based on any theory of cognitive or intellectual functioning.

The decision for using any particular test question is not based on any commonly agreed upon definition of cognitive processes or intelligence. It is not known what intellectual skill is being assessed by any particular subtest Farnham-Diggory (1970) has observed...

> "Many Level II tasks (Jensen's Analysis) are such jumbles of psychological functions that a defective performance tell us very little about the systematic nature of the defect itself."

Even when one examines tests which are supposed to be specific measures of factors such as Thurston's Primary Mental Abilities Test (PMA), Farnham-Diggory states...

> "Each test is clearly a conglomerate of functions and we have no way of knowing which mental operation is in fact more difficult for Black children." (pg. 2)

Sigel (1963) also cautions that the narrow range of abilities and correct answers which apply to intelligence tests limits our understanding of cognitive processes involved. Stodlsky and Lesser (1967) after finding interesting differences in the pattern of abilities among Black and other ethnic populations report...

> "The types of achievement and intelligence tests which are most often used can have only limited value in describing the cognitive functioning of children...looking at the scores and psychometric tests tells us nothing about the ways the students arrived at a conclusion."

Finally, Throndike, et al. (1927) comments...

> "Exiting instruments (ability tests) represent enormous improvement over what was available twenty years ago, but three fundamental defects remain. Just what they measure is not known; how far it is proper to add, subtract, multiply, divide, and compute ratios with the measures obtained is not known; just what the measures obtained signify concerning intellect is not known. We may refer to these defects in order as ambiguity in content, arbitrariness in units, and ambiguity in significance.

That there is imprecision and confusion about what I.Q. tests are measuring is evidenced in the Stanford-Binet Intelligence Scale Manual itself which states concerning the critieria for selection of items...

> "The test maker is concerned with the selection of tests that show an increase in precent passing successive age levels...with the 1937 scale, form L, at the III year level a correctly located item...building a bridge with blocks, was passed by 73 percent of the three-year-olds, whereas the vocabulary test at the X year level was passed by only 59 percent of ten-year-olds. And because no item in our scales are perfect or ideal items for measuring

intelligence, and no sample is ever entirely free from influences of selective factors, and percentages will not be exactly the same for each test at each age level."

A reasonably close inspection of the content of ability tests will reveal serious problems in defining cognitive processes being assessed.

The following example from Stanford Binet, Form L-M illustrates this point:

Item: Age IV, 4 MATERIALS

	Correct	Incorrect
"What is a house made of?	Wood, boards, bricks cement, stucco, shingles, stone, lumber blocks, rocks	sticks, nail walls
"What is a window made of?	Glass, wood & glass, glass & steel	Wood, screen putty
"What is a book made of?	Paper, cloth, leather plastic, pages are made of paper & the outsides are made of something hard	Pictures, pages, cards, pastings, made out of pictures and covers.

What cognitive principle is measured by this item? There appears to be no intellectual distinction made between acceptable and unacceptable responses and there is no consistency in the criteria invoked across the three questions. What critical intellectual ability is being discerned by accepting "A house is made of wood," and not accepting "A house is made of walls?" If one is distinguishing between these responses by using the criteria: "What materials go into the construction of houses:" then you simply have to be consistent and accept Nails as material, which is considered incorrect. If you are using materials as a criteria for houses then you have to use the same criteria for "windows" and accept Putty, Wood, Steel or Metal, which are considered inappropriate answers. Unless you mean, "what are all windows made of?" In which case glass would be the only acceptable response. But then not all houses are made of bricks or shingles. This inconsistency can penalize the child trying to understand what't being asked of her/him.

It can be generally concluded that the specificity of the accepted responses does not incorporate all correct and reasonably intelligent responses to the question. The only discernible criteria for not accepting some of these alternative responses is that by considering these responses as incorrect (although logically sound and intellectually no different from those responses which are accepted), places a significant percentage of children at the appropriate age level in the standard sample.

Tests yield little information regarding cognitive process

The constraints of test construction and administration do not provide for possible response biases in children, and therefore penalize children by failing to distinguish between performance and capacity. The interpretation of test scores for minority children is encumbered by the constraints imposed for the purposes of test reliability. It is axiomatic that the test must be administered using a constant format. This is an important consideration for those who wish to attribute the presence or absence of a particular capacity or competence on the basis of performance. In almost every case the tester is not permitted to probe or encourage individuals to try an alternative answer. What one is then measuring is the first response out- her/his first approximation. These rigid procedures penalize a child who has the capacity or ability to respond appropriately but because of reponse biases, i.e. responses which are frequently used and therefore have priority of access for the child, the child gives the first thing he/she thinks of. This may be a simple association, which is not what the tester is looking for. For example:

Item: Stanford-Binet Opposite analogies[1]

Tester: "Father is a man, mother is a_____?"
Child : " Lady."

Tester: "Snail is slow, rabbit is_____?"
Child : " Girl."

Tester: "The sun shines in the day, the moon at_____?"
Child : "Sky."

Since no feedback is given, the child must guess what the tester wants.

Item: Stanford-Binet Similarities

Tester: "How are wood and coal alike? how are they the same?"
Child : " They're hard."

Tester: " A apple and a peach?"
Child : " They taste good."

Tester: " A ship and a automobile?"
Child : " They're hard."

Tester: "Iron and silver?"
Child : "They're hard."

By this point the child appears to have decided that any thing she says will be alright. There is evidence earlier in the testing session that the child was seeking some definition of the task situation. Consider the following:

[1] The examples cited here are taken from the protocol of a five year old Black female child.

Stanford-Binet Picture Vocabulary

Tester: "What's this? What do you call it?"
Child : " Leaf."

Tester: (Writes in test booklet)
Child : " Now you got to write in script, right? Leaves."
" Can I look in the book?"

... Picture Identification

Tester: " Show me what we cook on...Show me the one that catches mice."
Child : (Points correctly, then comments..) "You forgot the clock."

Tester: " I know. We're not using all the pictures."
Child : " I'm good at this one."

...
Definitions

Tester: " Pat, what is a ball?"
Child : " You kick balls."

Tester: " What is a hat?"
Child : " You put it on your head."

Tester: " What is a stove?"
Child : " You cook. That's what you writing down?"
Tester: " Yeah. I"m writing down what you say so I can remember it later."
Child: (Incredulously) " Cause you don't know what it's for?"

The arbitrary narrowness of the frame for accepted responses is illustrated below.

Item: Opposite Analogies	Correct	Unacceptable
" A bird flies but a fish_____."	Swims	Just swims around all day.

Item: Naming Objects

In identifying a toy representation of an automobile scoring permits credit for "bus" but not "truck." What intellectual criteria is used in this case?

These examples illustrate several important considerations for testing culturally distinct children. The immediate (proximal) social and physical environment of these children may stress a different set of competencies and cognitive styles than those expected in assessment situations. The specific item content of both tests of ability and achievement may be unfamiliar to many of these children. This is partly the basis for claims of cultural bias in the tests. For example, items from the Metropolitan Readiness Test (MRT) consistently missed by Black children who do not do well on this measure (Miller-Jones,1980) include: windmills; specific dog breeds like collie vs bulldog or a friendly mutt (which they most often choose); stone vs brick house; tobaggan; spectacles; hoof vs hoop or horse-shoe; etc.

In addition, many children do not seem to share an understanding of the social context or the nature of the format in testing. Children either gave the kinds of scenarios reported above or said very little. Other factors influencing test response include: observed decrements in performance as a result of the interpersonal aspects of the testing situation (Canady, 1936; Pasamanick & Knoblock, 1955; Miller-Jones, 1980; Seymour & Miller-Jones, 1981; Boykin, 1977; Slaughter, 1979); socio-economic status and educational levels may effect performance outcomes (Haggard, 1954, Robinson & Meenes, 1947; Baughman & Dahlstrom, 1968); and early infant environmental and language experiences may produce lower scores (Hess & Shipman, 1965; Seymoure & Miller-Jones, 1981).

Much credence has been given to verbal skills as measured by vocabulary items. Some have cliamed that verbal ability as assessed by these tests is the single best predictor of "intelligence." There are difficulties with these items, not only because of well documented evidence that many Black and minority children show a kind of verbal defense behavior in the testing situation (Labov, 1970), but also because there appears to be little concern for what the child is thinking, no consideration for alternative highly abstract responses to definitions, and the narrow range of verbal behavior tapped by the test items and format. For example:

Item: VI year Vocabulary

Scorch - no credit given for "Takes whitening out of clothes"

(comment - child is saying in a most abstract way that scorching something amounts to the removal of "whitness" - burning something with an iron shows up most on white cloth.)

Brunette - Credit is given for: Black or Brown hair

No credit it given for: Kind of light colored hair
light brown, reddish brown
auburn colored

Webster's Dictionary: "... of a reddish brown color, a moderate brown."

(Comment - to only accept brown or black shows the tests lack of intelligence! In judging values along a color dimension the same color may be expressed as either darker or lighter depending on what your standard is. If you are European, perhaps Blond is your standard and brunettes are clearly darker brown or black within this frame of reference. But if your standard is black hair then brunettes are "kind of light colored hair.")

On what basis would you account for the accepted and no credit responses?

Peculiarity - + Somebody with pink eyes - you'd call them peculiar.
- Somebody that's kind of funny looking.
+ Some people are peculiar - the don't talk much and they're awful still.
- Like people talk to fast and stutter.

(Comment - credit responses seem to contain the word "peculiar" but we are often told that the use of the work within its definition is not permitted.)

Priceless - no credit given for intellectually sound literal translations:

- i.e. price-less without price
- "no price on it, not marked"

Regard credit given for: "Respect for a person"
no credit given for: "You like what a person does."
(as having high regard for someone?)
"When you send your congratulations" (as in Best Regards?)

in this case.

It can be generally concluded that the specificity of the accepted responses does not incorporate all correct responses to the question.

While many of the examples cited above are taken from tests of mental ability, the same qualifications and concerns obtain for standardized achievement tests. Supporters of the use of standardized tests claim that intelligence tests attempt to measure general cognitive abilities or aptitudes independent of specific training or experience. Tests of general intelligence, Spearman's "g" factor, have, however, been criticized as not being very different in content and format from traditional measures of achievement (Ginsburg, 1972; Schwartz, 1975). Although one can distinguish in principle between tests of ability and achievement, this conceptual distinction is not easy to operationalize. Consider the following ten questions:

1. We see (children, plants, stars, houses, trees) only at night

2. Bill bought two pads of paper at 25 cents each and four pens at 20 cents each. How much did he spend? (1.30, 45¢, $1.05, none of these)

3. Sob means (prejudice, solemn, sigh, joy, kind).

4. When a new kind of machine is created it is called (an adoption, an invention, a fabrication, a novelty, a discovery).

5. Which term is missing in this series? 3.5.7.?.11.13 (8,9,10, 14,15)

6. Which term comes next in this series? 54, 45, 36, ? (31, 63, 25, 27)

7. Oxygen is a (compound, gas, solid, carbide).

8. To prove is to (agree, verify, see, mean).

9. Mary bought a comic book for 10 cents, some gum for 5 cents and a candy bar for 5 cents. How many cents did she spend in all? (15¢, 20¢, 25¢, 50¢, non of these?

10. The earth's crust is its (surface, energy, heat, poles).

Half of these questions are drawn from group ability tests and half from achievement tests, all designed for grades 4 to 6. (Taken from Schwartz, 1975. pg.38) The external validation of intelligence tests is largely a matter of high but not perfect correlations with school success as measured by achievement tests! For example, Cronback (1960) reports correlations of .73 between I.Q. scores and measures of reading comprehension, .43 with reading speed, .59 with English usage, .48 with geometry, etc. Schwartz asks, why do

> "...group ability tests predict school achievement as well as they do? It seems to me that the answer is a quite simple one. Group achievement tests and group ability tests are sufficiently similar that without the labels one has difficulty telling which is which. If these group ability tests are used to predict, and group achievement tests used to confirm those predictions, why should anyone be surprised?"

Jensen (1980) dismisses criticisms of the tests which focus on cultural bias in the items by relying on Spearman's original unitary concept of intelligence or "g" factor. It is asserted that for the kinds of conceptual abilities measured in these tests involve "self initiated elaboration and transformation of the stimulus inputs," such as spontaneously using a conceptual category or classification rule in organizing information. As insurance against the tendency to question to quality of specific test items so often used as indicators of the tests lack of validity, Jensen refers to Spearman's "difference of the indicator," which means,

> "...that in an intelligence test the specific content of the items

> is unessential, so long as it is apprenhended or perceived in the same way by all persons taking the test. Any given item cannot, of course, be without content, but the content of the items is a mere vehicle for the essential elements of intelligence test items...The number and variety of items that can be invented for intelligence tests is limited only by the imagination of the test constructor."

This comment is further underscored by the following,

> "...the psychometricians and test publishers should be under no obligation to explain the causes of the statistical differences between groups...explaining the causes is not the primary responsibility of the constructors, publishers and users of tests."

It is easy to see why standardized test lack in cognitive viability. By not accepting responsibility for item integrity the tests are committed to cognitive bankruptcy. Again consider the competence-performance distinction when attempting to establish criteria for the presence or absence of an ability. In a sample of Black kindergarteners I worked with, the protocols from I.Q. tests were examined for evidence of stability in using conceptual categories spontaneously. The same child used in other examples in this paper, where she gave functional-relational definitions of objects, when asked what an orange was replied.." A Fruit." Here she shows precisely this ability to spontaneously classify according to conceptual category. She has the capacity for this kind of intellectual operation.

The issue becomes not one of the capacity for this kind of mental ability, perhaps one needs only one instance which clearly demonstrates the presence of the cognitive scheme. We must ask instead what are the behavioral and contextually imposed constraints which govern its occurence. Considering that the child has a repertoire of possible responses to a question, what determines the availability or priority of access to the one the tester has in mind?

On this point Gallimore & Au (1979) suggest

> "...There seems to be general agreement that children and adults who employ self-generated cognitive strategies perform better on school-type tasks than those who do not. Presumably because of the greater continuity between home and school, middle-class children are much more likely to use 'school-efficient' internally mediated cognitive strategies than culturally and socially disadvantaged children...The ready use of these strategies allows for more rapid adaptation to the school's learning style in which content is likely to be unrelated to daily life and initially meaningless to the child.
>
> If the failure to use self-generated cognitive strategies accounts for the poor school performance of disadvantaged minority culture children, then it is important to specify exactly how they are involved. Some researchers have assumed that disadvantaged child-

> ren lack certain school-relevant cognitive strategies. According to this'cognitive-deficit' hypothesis, we would expect to find uniformaly low performance on all school-type tasks...
>
> The results obtained at KEEP (Kamehameha Early Education Program),however,do not fit the pattern predicted by this assumption...What we see instead is a widespread inconsistency in performance across tasks and settings. This finding of inconsistency suggests that the children possess many of the same cognitive strategies as more school-successful middle-class children; the reason their school performance is so much poorer is that they apply the cognitive strategies much less consistently than their middle-class peers." (Pg.33)

And in a similar direction, J. Goodnow (1972) argues that race and social class differences on standardized psychological instruments may be a product of the subjects not knowing what she calls the "rules and rituals" and "tricks of the trade." She reports,

> "...To the extent that a rule grows out of some special experiences, or is learned 'on the job' rather than being available for widespread teaching, we should expect large differences between age groups and social groups, A difference between ages may stem not so much from a difference in capacity as from the slow accumulation of 'on the job' experiences...Some children do not spontaneously apply the rule (of varying one thing at a time) but this is only one aspect, perhaps just the most easily measured aspect of formal reasoning...The real lack (among these chinese children) is in the school experiences that bring the use of this procedure to a certain probability of occurrence."

Jensen (1980) spends considerable time discussing the nature of intellectual functioning, which Spearman called "noegenesis," or the perception of relationships, inducing the general from the particular. This is supposed to be at the center of the "g" factor assessment of mental ability. However, among the many characteristics of inductive reasoning and learning are the requirements of exposure to a rule-governed principle over time in many different contexts and with feedback about the appropriateness of one's response. These conditions are precluded by the standardized format of most tests. There are no probes permitted in these testing situations. In several studies which I have carried out, Black five year olds who performed poorly on standardized tests of ability were found to be highly inductive in their approaches to learning. When training formats were shifted from a rigid, no feedback situation to one which permitted children the opportunity to explore and discover the structure of the task, performance differences between high and low scoring children were not present.

It is important that the practicing clinician working with children, especially children from culturally different backgrounds, free themselves from the norms for systems of ordering and classifying, to try and ask " what is the logic behind this particular performance." "Can I ask a question which will reveal the child's logic?" There are multifarious influences determing the elicitation of the capacity one has in mind, whether in a testing or instructional situation. It will be important to develop flexible procedures initially, which considers the possibility that everyone has many problem solving strategies available. Because of ones particular social-physical ecology some of these cognitive processing strategies are more adaptive and come into use more frequently than others. Thus, one can conceptualize an individual as having a hierarchically organized repertoire of such problem solving strategies or heuristics. An important research agenda for the N.I.E./O.E. Follow Through effort in the 1980's should be the systematic exploration for patterns of these processing repertoires among minority children and the contingencies governing their use.

Using a single quantitative score to describe a range of complex cognitive operations.

Standardized tests presently do not describe cognitive problem solving processes involved in sufficient detail to be diagnostically useful. Further, if these tests continue to be used as decisive measure of learning, teachers will have to be quite courageous not to " teach to the test." In the chairmen's Report on the N.I.E. conference Testing, Teaching and Learning, Ralph Tyler and Sheldon White observe,

> "A teacher, school, or school system seeking to build a curriculum based on discussion, primary sources for social studies, and firsthand observations for science might find itself handicapped when it came time for testing. There might be gains from such teaching in terms of students' feeling responsible for their own education or coming to understand how inquiry is conducted, but such gains are not likely to show up next time a published test is administered. For immediate results on published tests, the premium approach is through the use of recitation and textbooks."

In the area of mathematics, for example, most achievement tests place primary emphasis on computation. The National Council of Supervisors of Mathematics (NCSM, 1978) suggests ten basic skills in math, computational algorithms being only one of these:

Problem solving
Applying Mathematics to Everyday Situations
Alertness to the Reasonableness of Results
Estimation and Approximation

Geometry
Measurement
Reading, Interpreting, and Constructing Tables,Graphs, and Charts
Using Mathematics to Predict
Computer Literacy

Responsible and enlightened educational efforts which attempt these objectives will certainly be under-estimated by their performance on standardized math tests.

Schwartz (1975) has criticized math achievement tests on the grounds that they not reveal anything about the subtleties of childrens' conceptual thinking in problem-solving situations. For example, typical items purporting to assess measurement ability like...how many inches are there in a yard? a) 12; b) 16; c) 3; d) 36; e) don't know... actually measures rote memory and tells us nothing about the child's conceptual understanding or ability to measure. What is needed is a clear description of the knowledge structure entailed in measurement. For example, selection of the appropriate attribute dimension to be measured when asked " How big is X (desk, chair, book,etc.)?" Does the child select weight, length, width, height, area, or volume? Or does the child recognize the inherent ambiguity in the question and ask... " What do you mean by big?", which shows sophistication with these aspect of the measurement concept. Selection of appropriate unit of measurement would be another candidate for a measurement nomological network. Does the child choose to measure a desk in feet, meters, pounds or kilograms or does she use miles, angstroms, cm or grams? These concepts might be followed by the ability to estimate (can they approximate the measure? How do they deal with partial units of the metric?) and computational ability (Can they carry out the measurement and perform operations such as multiplication required given the attribute dimension selected, e.g. volume or area?).

Competence in measurement and estimation are best ascertained by observing active behavior and engaging in verbal interactions which standardized tests do not provide. Can we produce tests with these characteristics? The problem, of course, with taking a more clinical-probing approach to assessment, while desireable to get at the child's thinking and to establish better interpersonal rapport, is that it is difficult to achieve comparative results for children under the same condition. I believe it is possible to generate formats, not unlike those characteristic of Piaget's standard materials and interview procedures. Given the problems with quantitative scores purporting to represent the attainment of some ability, the practitioner must choose assessment techniques which are appropriate to their ends. Truely diagnostic cognitive assessments are gaining increasing attention in the field.

It is difficult to see how a numerical value, even for subtests which attempt to measure specific component skills,will be of much descriptive, diagnostic or program assessment value without some consensus from the subject matter specialist and cognitive psychology regarding what those skills are. This means that alternative systems which account for student gains in math, reading, and problem solving skills needs to be developed. One hopeful sign that these alternative assessment procedures are emerging comes from N.I.E. itself. In response to large scale concern over the affects of tesing on the quality of education, N.I.E. has called for the uniting of cognitive psychologists, educators, and technology. The direction presently being taken is toward assessment which provides: 1. a clear description of the structure of the information domain being taught and tested, for example flow diagrams of the various concepts and algorithms for multiplication; 2. descriptions of possible strategic approaches and problem solving heuristics children might employ given an information domain;and 3. making these descriptions available in a form which is immediately useful in the teaching and learning setting, i.e. in sufficient detail as to be diagnostically useful. I would only add to this list the need to have descriptions of the various kinds of cognitive systems Black and other minority children have and some understanding of the conditions which elicit them. Together these approaches present an ideal model for the documentation and evaluation of the next wave of Follow Through programs.

Learning Characteristics of Black Children

After nearly two decades of research the reasons for poor performances on the part of a disportionate number of Black children on traditional measures of academic achievement and mental ability are still unclear. Explanation offered for this consistent pattern of poor performance have ranged from environmental or cultural deprivation to nutritional and genetic factors. With few exceptions, the previous research in this area seldom reflected any understanding of the cultural and community contexts which may have already engaged the intellectual abilities of these children.

The perspective of the research reported here is that: 1. the social-cognitive ecologies of many Black, low-income, and other minority populations influences the child's information processing styles; and 2. these cognitive styles conflict sufficiently with the task demands, information processing expectations, and social contexts found in most conventional assessment situations to produce the observed performance decrements.

Of critical importance to empirical research in Black psychology is the question of whether or not Black and other culturally different populations develop qualitatively different intellectual processes which have thus far escaped our theoretical constructs of mental functioning and methods of assessment. It has been suggested, for example, that most western paradigms of intellectual development have centered around the child's understanding of pyhsical environment phenomenon and have given little attention to social contribution to the content and form of cognitive processes. It is also possible, however, that there are no inherent qualitative differences in the kinds of cognitive processes available to culturally different children, but that proximal and distal cultural environments stress the use of some information processing styles over others. The children, in this view, may have the capacity for the kinds of intellectual operations we are typically interested in evaluating, but they occupy a lower level of probability in occurence within the child's repertoire of problem solving heurestics.

The failure to consider Black children's repertoires of cognitive processes and the contingencies affecting their use may be one of several factors contributing to the lack of success in achieving a verdical integrated analysis of these children's abilities. The examination of the interface of social and affective components with cognitive or information processing parameters has proven difficult, in part, because the factors influencing performance on traditional measures of ability and achievement are multiple. It is difficult to design research which is sufficiently inclusive of all the critical variables affecting performance: e.g., separating the effests of social class from ethnicity; tester/teacher expectations and biases; the cultural salience and appropriateness of tasks, stimuli, and problem solving formats, to name a few.

There are a few studies which recognize the importance of using problem contexts and task formats which have ecological validity (Bronfenbrenner, 1974; Cole, et al., 1974; Labov, 1970; and Neisser, 1976) and attempt to elucidate the nature of the logical processes and cognitive skills in Black children from the perspective of their adaptations to the task demands of their social ecologies. Hilliard (1976), borrowing from the work of Cohen (1971), has suggested several areas of difference in the cognitive styles of many Black children. For example, these children are typically affectively oriented and use what could be considered <u>relational</u> styles while schools typically support and are oriented to <u>analytic</u> styles. Briefly, Hilliard suggests that:

1. Afro-Americans tend to respond to things in terms of whole picture instead of its parts. The Euro-American tends to believe that anything can be divided and sub-divided into parts and that these add up to a whole.
2. Afro-Americans tend to prefer to focus on people and their activities rather than things or objects.
3. Afro-Americans have a keen sense of justice, are quick to perceive and analyze injustice and tend, therefore, to lean toward altruism and social cooperation.

4. Afro-Americans tend to prefer novelty, freedom and personal distinctiveness.
5. Afro-Americans tend not to be "word" dependent for meaning, relying heavily on actual behavior and experience.

Hilliard suggest then what schools might look like if they adjusted to these cognitive styles of many Black children. (see table 1) While this characterization is brief and not systematically documented it is suggestive of important dimensions of variation in cognitive orientation between some Black children and that expected in school related environments.

It is interesting to note that Cohen found relational conceptual styles, "...originated in "shared-function" families (those in which critical group functions are widely shared or indiscriminately performed by all members without pre-patterning)..." This "shared-function" was also observed in peer and social groups. Cohen suggests that "...shared function primary group organization...is responsive as a whole to chance changes in its external and internal environment." From the members points of view this results in a "fluid and constantly shifting distribution of functions." (p. 47).

This observation suggests that it will be terribly important to look at social patterning within children's home and neighborhood environments for determinants of cognitive organization, Hilliard's and Cohen's work are also related to Sigel's distinctions between relational-functional and categorical-inferential conceptual styles. Sigel (1970) argued that lower-class children use more relational categories in classifying pictures and that these kinds of classifications by lower-class children reflects differences in representational competence produced by the lack of distancing experiences in lower-class homes. Distancing experiences are considered those which provide the opportunity for differentiation and abstraction. By implication, middle-class home experiences foster more cognitively sophistocated categorical-inferential styles, which require the imposition of more abstract conceptual structure on task stimuli.

TABLE I

The School

(complilled by Asa Hilliard)

As it is in general (Analytical)	As it could be (Relational)
Rules	Freedom
Standardization	Variation
Conformity	Creativity
Mmeory for specific facts	Memory for essence
Regularity	Novelty
Regid order	Flexibility
"normality"	Uniqueness
Differences equal deficits	Sameness equal oppression
Preconceive	Improvise
Precision	Approximate
Logical	Psychological
Atomistic	Global
Egocentric	Sociocentric
Convergent	Divergent
Controlled	Expressive
Meanings are universal	Meanings are contextual
Direct	Indirect
Cognitive	Affective
Linear	Patterned
Mechanical	Humanistic
Unison	Individual in group
Hierarchical	Democratic
Isolation	Integration
Deductive	Inductive
Scheduled	Targets of opportunity
Things focused	People focused
Constant	Evolving
Sign oriented	Meaning oriented
Duty	Loyalty

Simmons (1979) considered this formulation as biased, placing higher value on categorical-inferential styles, as well as being insensitive to the possibility of culturally conditioned diversities in cognitive strategies. If this is true, however, one would expect to find a developmental pattern among middle-class children showing increasing use of this more sophisticated conceptual style. Research by Davis (1971) finds that children from fifth grade through college show no decline in the use of relational styles with increasing age and this classification scheme was, in fact, the most frequent style at every age tested. Davis' study also indicated that subjects did not show a preferential pattern in the use of any of these particular styles and that the diversity of strategies used increases with age.

Simmons further argues that the observed differences might be attributable more to differential knowledge about the picture stimuli than to social class differences in cognitive capacities. Here again the issue of competence or capacity vs performance is an important distinction. To test this possibility Simmons generated a set of Sigel like pictures which would have more cultural salience for Black and lower-class children. The Simmons modified test contained pictures for classification depicting objects, persons, and activities which occur frequently and are highly valued within particular sub-cultural groups. For example, academic cultural activities, white collar occupations were found to be relatively more salient for White and middle class children and games, sports, blue collar occupations and entertainer-athlete occupations were more culturally salient for Black and lower class children. The children in the study were 112 fifth and sixth grade males, 28 in each of 4 groups: Black middle class: Black lower class; White middle class; and While lower class.

The results are: 1) middle-class children of both ethnic groups used more categorical (c-) reasoning on both tests but 2) Black subjects from both middle and lower class used more c-reasoning on the culturally salient materials presented in the Simons test. In other words, the cognitive sophistication in

classification strategies children used depended on the cultural salience or relevance of the pictures used. Simmons cautions that there is an important difference between cultural salience and cultural familiarity. All pictures were familiar to all the children but the salient pictures represented domains for which the child had greater depth of knowledge. In order to achieve accurate assessment of cognitive processing competence, materials should be used for which subjects have more elaborate knowledge structures and from which meaning can be extracted. Simmons states...

> "One of the major cabeats in the findings is that characterizations of the ability or response styles of members of various sub-cultural groups should not be made based upon operations performed on a single set of procedures and materials. Introduction of the Simmons test in the present study, in effect, damaged the validity of previous statements concerning the existence of social class differences in representational competence... One way to avoid this problem is through the use of within subjects designs (such as the SCST-Simmons test and Simmons subset comparisons) that promote attention to interactions...the interactions that can occure in a within-subjects design allow for greater separations of the effects of group differences in competence.. The final methodological point that I'd like to make is that using more than one task to measure a skill broadens the range of application of the processes that are being examined, which in turn enhances the validity of generalizations that are made about how the skill is used on other kinds of tasks." (p. 44-45)

Further evidence that the cultural ecologies of some of these children place different demands on the structuring of their intellectual styles is provided by Franklin and Fulani (19[illegible]). Franklin argued that the reason many Black children failed to show spontaneous categorical clustering of verbal items is free recall tasks was not that these children didn't have the conceptual ability or capacity to re-organize these items in memory but, rather, that the appropriate categories were not used to elicit this kind of strategy. Using more environmentally relevant taxonomic categories such as card games, dances, soul food, etc. they found that when items from these categories were presented randomly Black children recalled more of the items and, in reporting them back, showed spontaneous clustering according to conceptual categories.

Boykin (1975, 1977) has also attempted to incorporate aspects of Black cultural/physical ecology in suggesting that high ambiant levels of stimulation experienced by many Black children may lead to high levels of activation and needs for stimulus variation in both affective, cognitive and behavioral domains. Boykin has offered tentative evidence for this "vervistic" quality in Black children's cognitive systems by demonstrating superior performance on several tasks which vary in format. The subjects were third and fourth grade Black and White children who were asked to solve five instances each of four types of tasks. The tasks were 1) a 10 digit ordered recall task, 2) a story listening task, 3) a visual scanning task and 4) a 10 dot pattern schema reproduction. The tasks were presented either in a relatively unvaried format where each task-type was represented together in a block or in a varied format where the tasks were presented in random order. Boykin found superior performance among the Black children when the task format varied greatly. The more changing the format the better the performance of Black versus White children.

This finding of the need for more variation in stimuli may relate to other observations which suggest that Black children are more affectively oriented and that they pay more attention to the "peri-conceptual" cues that are non-format specific. The often reported finding of more effective performance stemming from rapport with the tester may result from the fact that establishing a positive relationship with the tester serves to free-up perceptual cognitive systems allowing the child to attend to and process conceptual information in the task rather than devoting time to attending to and processing affective cues in the test situation.

The implication for cognitive assessment is clear. One should use a number of different materials and task contexts in making a determination of a child's level of cognitive development or competence. However, such multimethod approaches also require a validation procedure which establishes the relationship between these various abilities and those taught in school. Numerous studies have yielded contradictory results on the relationship between performances on intelligence tests (e.g. Raven's Progressive Matrices). Piagetian conservations and other logico-perceptual operations, and the development of academic skills such as reading (Ehri, 1979).

These studies represent significant contributions and are encouraging. However, in the absence of an integrated conceptual paradigm this research may be viewed as inconsequential and its impact limited to the perceived necessity of making only minor adjustments in test and assessment procedures.

or task content. At present two frameworks seem to afford such an integration of these observations into an appropriate construct of intellectual functioning in Black children who perform poorly on standardized measures of mental ability and academic achievement. These frameworks are the adaptive analysis of social behavior and the processes of rule induction.

Miller-Jones (1980) attempted to investigate the subtle aspects of cognitive performance, i.e. the social and motivational contributions to the deployment of intellect, among a group of low and high achieving Black kindergarten children. The research offered rule-induction and transfer in learning as a more comprehensive model of the cognitive styles of poor academic performers and considered the influences of the child's proximal (immediate) social ecology on their cognitive and social competence.

The principles of rule-induction which could form the basis for instructional activity and assessment are:

1. Rule induction involves the extraction of regularities and the abstraction of these regularities into higher order units or rules;
2. The induction of rules requires exposure, experience and practice over a relatively long period of time, explicit statement of the rule alone is not enough;
3. The acquisition of a rule and its transfer requires the use of the same rule in a variety of contexts and experiencing the appropriateness of the rule under different conditions-deductive learning is largely decontextualized learning;
4. Rule acquisition processes appear to require the active involvement of the child with the opportunity for making errors and obtaining informative feedback about errors in a relaxed non-threatening atmosphere;
5. As in language learning the child's competence will exceed her/his actual performance, i.e. what the child knows will preceed what they can actually do;
6. Learning in this modality is typically autonomously regulated in the child, structure is in the stimulus or the task; and
7. Motivation for the induction of rule-governed systems is intrinsic-cognitive motivation. Given that the child is experiencing conditions of information overload, inducing rules leads to more economical and efficient processing of information, thereby permitting more selective attention. In addition, the use of these more efficient rule induced strategies should enhance the child's effect-

iveness or competence in negotiating his/her environment. Mastery of rules, then, while inherently rewarding, may also provide a kind of functional motivation.

Miller-Jones reports data from social interactions under natural conditions in schools and observations from the home environments of these two achievement groups and finds support for the use of inductive learning styles in the low school achievers. High achievers experience a somewhat more systematic exposure to rule governed structured social situations. Their interactions indicate a greater access to adults as resources and opportunities to gain information, display competencies and control in influencing the direction of activities. Low school achievers in this study experienced a wider variety of adults and peers across more varied contexts and situations, which obstensibly require a greater diversity in response repertoires. Low achievers had more active participation and exerted more influence in settings outside the home. The demands of such diverse behavioral settins is viewed as a correlate of inductive approaches to learning and is seen as an adaptive learning strategy in situations where the structural parameters are implicit or not known. Here one attempts to determine the boundary limits and conditions defining the situation or task via a kind of scatter gun approach to foraging for information, getting a lot of data quickly and formulating concepts contingently.

In addition to home observations, analysis of differences in social orientation were also obtained from video-taped social interactions of randomly assigned dyads under a common observatinal condition in school and playground settings. Adaptive social functions in these interactions were assessed using a code for consequences or " pay-offs" the children received, which included 75 specific items clustered under the larger categories of Getting Information, Services, Recognition, and Behavior from either peers or adults. The behaviors employed by children which resulted in these consequences were also coded.

The results indicated that high and low achieving Black children differed in their social-motivational systems. Low achievers received more Information, Recognition, Behavior and Services than high achievers and used a wider variety of behaviors antecedent to receiving these consequences. High achievers received proportionately more information and services from peers, while low achievers received relatively more of these from adults. For recognition, i.e. positive recognition, consequences this pattern is reversed, with high achievers getting proportionately more recognition from adults and low achievers more

from peers. High achievers appear to be more selective, permitting peers to inform and service them, while soliciting recognition for their abilities and accomplishments from adults. With the exceptions of getting information and negative recognition, low achievers showed greater diversity in the organization of the behavioral repertoires used for getting consequences.

The adaptive significance of this social strategy may be understood in terms of its value for inductive learning. When faced with new or less predictable situations these children more typically may seek wider stimulus imputs from which pattern, regularity and rule-governed principles can be extracted or induced.

Performances on experimental multiple-classification tasks revealed no differences between these achievement groups when children received pretraining which modeled the conditions for rule induction, i.e.:

- Familiarize them with the over-all structure of the problem-task format
- Provide early success in the use of two-dimensional classifications in a variety of "game-like" contexts
- Providing positive information feedback
- Providing opportunities for autonomous control and the use of coordinated information by permitting the child to set up problems for the adult.

Results from multiple classification problems presented in Venn diagram formats in either a deductive (where the rules of explicitly given) or an inductive format (where examples of the rules are provided and the child has to figure out what the rules are) confirms the inductive learning style hypothesis. Low achievers required fewer trails to criterion and reached criterion with fewer correct placements on transfer problems than did high achievers, if they had first attempted a problem set where they had to figure out or induce the rules.

That there is indeed a systematic structure underlying the behavior of low achieving Black children is often obscured by the apparent diffuse and unorganized surface qualities of their behavior. This organized quality becomes more transparent when one considers that these children might be more highly reliant on inductive thinking for determining the structure and rule-governed properties of social and cognitive tasks.

How general is this learning style? Cross cultural research suggests it may indeed be a property of the learning styles of a great many children from diverse backgrounds. In accounting for the common observation in cross cultural research for the effects of schooling, Cole and Scribner (1974) suggest that with schooling there is a tendency to generalize rules and operations across a number of different problem formats. Jean Lave (1977) argues that

schooling is not the only way to acquire generalized cognitive skills. Lave found evidence that numerical skills acquired in the context of tailoring apprenticeships transfer to arithmetic problem solving success on unfamiliar problems. How are these generalizable operations acquired? Lave suggests:

> "Apprenticeship training whose major instructional mode is observation and practice...stands in sharp contrast to verbal instruction and context free presentation of materials in school. This suggests that a major contrast (is) that schools emphasize deductive teaching/learning while inductive transmission of knowledge is the most common mode of teaching/learning in apprenticeship...We assume that is tailoring experience leads to high performance on unfamiliar arithmetic problems, it will occur because of a process of inductive generalization." (177-178)

Low achieving Black children may need environments for rule learning which permits and encourages this exploration of problem contexts, opportunities for making errors, and getting feedback on them. The implications of this research for educational settings involve the greater use of instructional approaches which give children experience with concepts and rules in a context which permits the discovery of principles and their effectiveness in solving problems. The challenge is to design assessment procedures which will be effective in evaluating the childs learning under these conditions.

Summary

This brief section on cognitive processes among Black children has been necesarily selective. There are apparent differences in the disposition to use some cognitive styles, e.g. vervistic and inductive qualities of Black children's thinking. Assessment procedures in language and cognition, in addition to being sensitive to these distinctions, must take into consideration the importance of context, the use of culturally important and personally meaningful materials, and the establishment of an optimal and trusting relationship with the child. Therefore, research on cognitive style characteristics of many Black children constitute the basis for the following recommendations to be considered in language and cognitive assessment:

1. Use multiple cognitive and language elicitation materials in assessing any particular cognitive and language structure.
2. Use Culturally salient cognitive and linguistic elicitation subject matter and materials.
3. Make the tes environment as familiar and comfortable as is possible
4. Vary cognitive and linguistic tasks relative to inductive versus deductive processing styles.

5. Establish pre-test success in an inductive learning mode with various samples of the types of cognitive and language tasks to be assessed.
6. In assessing academic-cognitive processes in culturally distinct children it is important to be clear in defining the mental operations of concern independent of the specific task context in which they are measured.
7. There is precious little data relating performance on conceptual and other cognitive tasks to performance in school related skill areas such as reading, math, science, and social studies concepts. Clearly research establishing such linkages between various cognitive operations and subsequent performance on school related skills, especially from a developmental perspective, would help enormously to clarify which aspects of cognition are critical for diagnosis and intervention..
8. For diagnostic uses of assessment profiles of most common errors and processes which produce these patterns are very informative. The student can be shown how they arrived at their answer, that it was a reasonable and logical way to approach the problem, but that certain conditions of the problem require a different approach or algorithm. It is often not a failure to use a self-generated cognitive strategy that accounts for poor school performance. Rather it is the inconsistent application of cognitive strategies across tasks and settings. This suggests that these children possess many of the same processing abilities as more school-successful children, they simply fail to recognize the task and identify the type of cognitive operation called for.
9. Assessment procedures which do not permit examiners to probe for the reasoning behind a child's response to an item will be of limited value. Test items should be designed to elicit the most sophisticated, complex or at least most appropriate cognitive processes in these children.

Policy for Evaluation

It is recommended that the National evaluation of "Planned Variation" models of Follow Through Programs be discontinued. In its place the following system of documentation is offered.

1. Since each Follow Through site should ideally want to achieve the same common set of objectives, the only thing that varies critically

from site to site are instructional approaches, nature and characteristics of the population being served, and the configuration of resources and services provided at various locations. What is needed is the development of common descriptors for children in terms of social orientation and cognitive style. Perhaps some the characteristics suggested in this paper and others would serve as a starting point. Data in a uniform format for children's health and nutritional status would also be extremely important.

A standardized set of categories, with sufficient descriptive detail would also have to be generated in order to specify the learning environments experienced and for how long.

Research needs to be conducted which provides process descriptions of subject matter domains and possible processing strategies useful in the attainment of competence in those domains. Again these need to be applied at each F.T. program site.

There needs to be on-going sharing between various F.T. program efforts in order to up-date and spread the data collecting system; to discuss with subject matter specialist and cognitive psychologist processing models available for reading, math, science, etc.

These sessions or conferences should be attended by representatives of each project (teachers, parents and older children who have graduated from these programs.

These documentation conferences might be held regionally four times a year and organized by themes such as, instructional approaches, learning characteristics of populations served, methods of assessment of academic learning,etc.

Evaluation design should focus on with-in subject measures and derive group analyses from population characteristics similarities and instructional exposure.

In other words, we need to take a bottom-up approach to documentation and instrument development. Since future test construction will have to move in this direction anyway why not have them sensitive to F.T. needs?

The history of Follow Through thus far reflects the talents and energies of large numbers of capable, dedicated, sincere people. We should try to build on the work that has been done where ever possible.

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